

PATENT ABSTRACTS OF JAPAN

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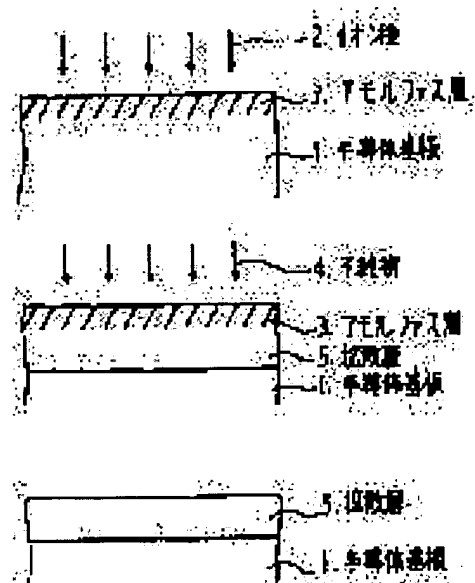
(21)Application number :	02-400329	(71)Applicant :	FUJITSU LTD
(22)Date of filing :	04.12.1990	(72)Inventor :	KIMURA MASAMI IIZUKA JUNICHI

(54) MANUFACTURE OF SEMICONDUCTOR DEVICE

(57)Abstract:

PURPOSE: To form a deeper junction layer in a semiconductor substrate at a low temperature and in a short time by a method wherein the surface of a semiconductor-substrate material is formed as an amorphous layer or a crystal layer corresponding to it, a defect is formed and, after that, impurities are ion-implanted.

CONSTITUTION: Ion seeds 2 which do not contribute toward activating a semiconductor substrate 1 are ion-implanted into the substrate 1; an amorphous layer 3 or a layer corresponding to it is formed on the surface of the substrate 1. Then, impurities 4, of boron or phosphorus, which contribute toward activating the substrate 1 are implanted; the substrate 1 is heat-treated; the impurities 4 are enhanced and diffused into the substrate 1; the layer 3 or the layer corresponding to it on the surface is etched and removed. That is to say, the impurities 4 which do not contribute toward activating the substrate 1 are implanted into the surface; its crystallinity is disturbed; a defect layer is formed; the impurities 4 are ion-implanted; the substrate is heat-treated; the enhanced diffusion of the impurities 4 is caused by the defect on the surface; a deep diffusion layer 5 is formed. Since the defect is left on the



surface of the substrate 1 in this case, the defect layer is removed. Thereby, the crystallinity on the surface becomes good, and it is possible to form the deep diffusion layer easily by a short-time heat treatment at a low temperature.